DOCUMENT RESUME

ED 160 140 JC 780 499

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TITLE A Comparison of the Effectiveness of Individualized and Traditional Instructional Methods for Student Nurses.
PUB DATE 78
NOTE 24p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Audiovisual Aids; Community Colleges; Conventional Instruction; High Achievers; Individualized Instruction; *Junior Colleges; Low Achievers; *Medical Education; Nurses Aides; *Nursing; Performance Factors; *Teaching Methods
IDENTIFIERS ACT Assessment

ABSTRACT

The objective of this study was to determine the effectiveness of an audio-visual instrument in teaching psychopharmacology to high and low achieving associate degree nursing students at Alvin Community College (Texas). Students were grouped as either high or low achieving according to their scores on an American College Testing (ACT) program test battery. High achievers scored between the 66th and 95th percentiles; low achievers scored between the 5th and 33rd. Students scoring above the 96th, below the 5th, or between the 34th and 65th percentiles were eliminated. Students in both high and low achieving categories were divided between traditional and experimental groups. The experimental group had at their disposal in the learning resource center a 30-minute coordinated slide-tape presentation about the actions, uses, major side effects and nursing implications of the drugs most commonly used in the treatment of psychiatric disorders, which could be viewed as frequently as desired by individuals or groups. Traditional instruction consisted of a one-hour lecture with no audio-visual aids. Results were measured by a 50-item multiple-choice test. No significant difference was found in the scores of high or low achievers taught by either method. Data tables and a bibliography are included. (MB)

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A COMPARISON OF THE EFFECTIVENESS OF INDIVIDUALIZED AND TRADITIONAL INSTRUCTIONAL METHODS FOR STUDENT NURSES

by

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ABSTRACT

This replicated study was aimed at determining the effectiveness of teaching psychopharmacoloty to high and low achieving A.D. student nurses via an audio-visual instrument designed by the researchers. For two consecutive years, one hundred student nurses at Alvin Community College were divided into high or low achieving groups according to A.C.T. scores and were randomly assigned to either traditional lecture group or audio-visual individualized learning group. Results were measured by a fifty-question, teacher-made test. It was found that there was no significant difference in the scores of high or low achievers taught by either traditional lecture method or by individualized audio-visual method at .05 level. The finding supports the importance of motivation in learning.

A COMPARISON OF THE EFFECTIVENESS OF
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Since 1970 the faculty of Alvin Community College associate degree nursing program has had difficulty providing appropriate learning experiences for the psychiatric nursing classes in which approximately 120-150 students are enrolled per semester. These students come from a wide variety of backgrounds, range in age from 18-65, represent a wide mixture of marital and family status, and are of both sexes. As Lipson points out, this lack of homogeneity complicates the problrm of providing a suitable learning environment. (Lipson, 1972, pp. 4-9) Although the content of the psychiatric nursing course is based upon behavioral objectives, due to the size of the classes most of the content is presented via lecture to large groups of students in a crowded room. These large groups limit student-teacher interaction and as Martin Buber says, "Contact is the primary word in education." (Rogers, 1969, p. 101) There is virtually no individualization of instruction except in the clinical laboratory. The faculty is further hampered in providing good learning experiences by the fact that although clinical

experiences are closely related to the classroom content and the behavioral objectives, many of the affiliating agencies do not permit the student nurses to administer medications to their patients.

Since a nurse's education does not end when graduated, "a major goal of nursing education must be the education of a nurse practitioner capable of self-direction and willing to assume the responsibility for his or her own actions." (Toengay, 1972, pp. 3-12) Self-direction and acceptance of responsibility are learned behaviors. Learning psychologists have demonstrated consistently that "the only learning which significantly influences behavior is self-discovered, self-appropriated learning." (Rogers, 1969, p. 153) If the student nurse is encouraged to assume responsibility for personal learning, that learning will be more significant and the nurse will learn in an individualized way and at his or her own speed. Kristen Hanson described how independent study based on assumption of responsibility for her own learning revitalized her interest in nursing. (Hanson, 1974, pp. 329-330)

Confronted with large undergraduate botany classes at Purdue University, in 1961, Dr. S.N. Postlethwait developed an audio-tutorial approach for teaching and found that stu-

dent grades improved and failures decreased. (Keller, 1968, pp. 78-79) Since that time there has been a proliferation of audio-visual aids used in teaching nursing, which has made individualizing instruction easier. Two questionnaires sent to 500 directors of hospitals and deans of schools of nursing show that audio-visuals have become a prime component of the instructional program. (Nursing Outlook, 1975, pp. 33-34) However, the majority of these audio-visual aids are geared toward instruction in medical-surgical nursing skills. Little research has been done about whether associate degree psychiatric nursing students achieve better mastery of material when taught by the few audio-visual aids available than when taught by more traditional methods.

The purpose of the study was threefold. One was to determine the effectiveness of teaching psychopharmacology via an audio-visual instrument designed by two faculty members. Another was to determine if this instrument differs in its effectiveness for teaching high and low achievers. A third was to replicate the study conducted by Biegert and Withrow in 1977.

A review of the literature revealed research comparing the knowledge attained by students utilizing an individualized system of instruction and those attending large lec-

ture sessions. In a replicated study Johnston and Pennypacker compared large lecture groups and individualized groups in a single psychology course and found that undergraduate university students working in individualized groups performed better on an objective exam than did the students in the large lecture group. (Johnston and Pennypacker, 1971, pp. 219-244) Sheppard and MacDermot compared students receiving individualized instruction in an undergraduate college course in the psychology of learning and those attending lectures and found that the individualized group scored significantly higher on an objective final exam. (Sheppard and MacDermot, 1970, pp. 5-11) Jernstedt found that undergraduate university students taking a psychology course under individualized instruction performed better on an exam similar to unit activities than did students receiving instruction under the traditional lecture-examination format. (Jernstedt, 1976, pp. 211-218) Born, Gledhill and Davis found that undergraduate psychology students educated with personalized procedures performed at a significantly higher level on the final exam than students attending lectures covering the same material. (Born, Gledhill, and Davis, 1972, pp. 33-43)

Individualized instructional methods have a different impact on high, average and low achievers. Born, Gledhill

and Davis found that personalized procedures had the greatest impact on university students with average or poor academic records. (Born, Gledhill and Davis, 1972, pp. 33-43) However, studying results of individualized instruction in French at the junior college level, Harper found that high and low achievers benefitted more from individualization than did the "average" students. (Harper, 1974, pp. 1010) Koch felt that independent study keeps the bright student stimulated and facilitates the educational process of the slow learner. (Koch, 1975, pp. 29-32)

Audio-visual aids, available around the clock in a library or learning resource center, provide each student with a "front row seat" and ample opportunity for repetition. Harper utilized multi-media, self-paced, individualized methods in teaching French at a junior college and found that the overall achievement of the indidualized group was greater. (Harper, 1974, pp. 1-10) In a three year hospital school of nursing program Thompson utilized media in teaching medical-surgical nursing. She found that students preferred the media method to the traditional lecture methods, but there was no significant difference in learning retention one year later. (Thompson, 1972, pp. 453-456) Stein described application of multimedia, independent methods in the education of baccalaureate

student nurses over a two year period. She found the first experimental group to have no significant difference in achievement, and attributed their more positive feelings toward the course to the Hawthorne effect. The second year group also had no significant difference in achievement scores and stated that they preferred a written script to other audio-visual aids. Stein concluded that media should be used to amplify and clarify concepts and that unless students are actively involved in learning tasks, they get bored. (Stein, 1972, pp. 436-447) In a four year study at St. Mary's Junior College, Peterson studied the effectiveness of multi-sensory tutorial instruction in associate degree nursing education. She found that students taught by this method had a greater percentage of A's and B's and less D's and F's than did students taught by more traditional methods. The experimental group perceived themselves as more independent and self-directed than the control group. Students who had multi-sensory tutorial instruction achieved slightly higher State Board Examination scores, but these were not significantly different. (Peterson, 1973, pp. 1-225)

Multi-media, self-paced, individualized instruction provides many conditions that facilitate learning. The small package of content that can be used independently

provides the student the opportunity to work at his or her own pace and time and to repeat a learning experience as often as necessary until mastery is achieved. Jernstedt and Born, Gledhill and Davis demonstrated that this was true for undergraduate psychology students. This same individuality should also benefit associate degree nursing students with their diverse backgrounds and learning capabilities. Learning is also facilitated by the fact that the student is actively involved in the learning process and assumes greater responsibility for personal learning when using the multi-media, individualized approach. Stein concluded that unless students are actively involved in learning tasks, they become bored. John Dewey said that we learn what we do, or in other words, "the critical content of any learning experience is the method or process through which the learning occurs." (Postman and Weingartner, 1969, p. 19) Jernstedt demonstrated that students perform better when unit activities are similar to the behaviors required upon completion. The student nurse who is taught pharmacology without seeing or handling the medication is at a disadvantage. Visual perception of the medication studied should enhance learning. Although Koch, Harper and Bor, Gledhill and Davis disagree as to whether high, low, or "average" achievers benefit most from individualized instruct-

ion, there is agreement that personalized methods of instruction improve learning for all levels of students.

This study tested the hypothesis that when student nurses are taught psychopharmacology by multi-media, individualized methods, both high and low achievers attain better mastery of content than by using traditional methods.

The instrument developed by the faculty members consisted of a coordinated slide-tape presentation about the actions, uses, major side effects and nursing implications of the drugs most commonly used in the treatment of psychiatric disorders. Major concepts were depicted in graphic form and included were color slides showing the actual pills or capsules described. Humor was added to the presentation by using an occasional slide picture chosen for this purpose. Three copies of the thirty minute sound-slide presentation were placed on reserve at the Alvin Community College learning resource center where students assigned to the experimental group checked them out for viewing either in groups or alone. The students were allowed to use the material as often as desired during the open hours of the center, 7:00 A.M. until 9:00 P.m. on weekdays and 8:00 A.M. until noon on Saturdays.

The traditional method of instruction of psychopharmacology consisted of a one hour lecture given by the same

faculty member who furnished the voice on the taped experimental presentation. No audio-visual aids were used during the lecture except for writing the names of the medications on the chalkboard.

The students were grouped as either high or low achievers according to their scores on an ACT test (American College Testing Program test battery). This test was administered by the counseling center of Alvin Community College and was a requirement for admission to the associate degree nursing program. High ACT scores were operationally defined as those between 18 and 23 (the 66th and 95th percentiles) and low ACT scores as those between 9 and 13 (the 5th and 33 percentiles). Those students who scored 24 or above (the 96th Percentile) were eliminated, because it was assumed that they possessed such great ability that their achievement would not be affected by the teaching method. Conversely, students with ACT scores below 9 (the 5th percentile) were eliminated because of their presumed inability to comprehend the material despite the method of presentation. Students with ACT scores between 14 and 17 (the 34th and 65th percentiles) were eliminated as potential overlap between high and low achievers.

Since no standardized tests were available to test achievement in psychopharmacology, the students' mastery of

material was determined by their scores on a teacher-made, 50 question, multiple choice test.

There is a desire on the part of the Alvin nursing instructors to increase the effectiveness of the teaching-learning process, and any method which will help the student to learn better and to master the course content is sought. Multi-media, individualized instruction also lends itself well to the team teaching approach used at Alvin Community College and can be seen as adding stability to the course content.

Such research can be a stimulus to the decisions of administration to furnish resources such as media equipment and practice supplies to the students in the laboratory setting.

The study suggests further studies comparing the retention of knowledge acquired by traditional and individualized methods.

The sample consisted of associate degree student nurses enrolled in a psychiatric nursing course at Alvin Community College in Alvin, Texas. Students were enrolled in one of two lecture groups meeting for two hours twice a week. In 1977 the lecture groups met either 8:00 A.M. to 10:00 A.M. or 2:00 P.M. to 4:00 P.M. on Mondays and Wednesdays. In 1978 the lecture groups met either 8:00 A.M. to 10:00 A.M. on Mondays and Tuesdays, or 8:00 A.M. to 10:00 A.M. on Wednesdays

and Thursdays. Prior to the first class day the students were listed in three groups according to ACT scores. Students in each lecture group were then randomly assigned to either the experimental or the control group so that each group was composed of equal numbers of high, average and low achievers. In 1977 in order to control for the Hawthorne effect the students were told they were assigned to these two groups for planned learning activities throughout the course. In 1978 it was decided to risk the Hawthorne effect in order to control the sharing of lecture notes which had occurred across the groups in 1977. Therefore students were told they were participating in a study.

On the first day of class students were given a course syllabus containing the rationale for the course, detailed behavioral objectives, reading assignments in the text, and suggested optional reading assignments. All studnts were required to make medication cards for any drugs they were assigned to give. These cards included space for the generic name of the medication, route of administration, usual dosage, action, side effects and nursing implications. However, as stated earlier, the different hospitals to which the students were assigned varied in their policies about allowing student nurses to administer medications to psychiatric patients. Team teaching was used at Alvin Community College and so the students were exposed to a variety of teachers during the course. How-

ever, the psychopharmacology unit was taught by the same teacher whose voice was recorded on the experimental tape used in the multi-media individualized presentation.

The independent variable, instructional method, had two levels, traditional lecture method and multi-media, individualized method, as described above. The moderator variable, achievement level of the students prior to the study was measured by the American College Testing Program test battery (ACT) which included four parts: English Usage, Mathematics Usage, Social Studies Reading and Natural Sciences Reading, and focused on the basic intellectual skills required for satisfactory performance in college. Correlations between college grade point averages and composite scores on the ACT battery cluster at .50. The dependent variable, student performance, was measured by a 50 question, multiple-choice, teacher-made test. The split-half reliability of this test was .63. This figure was obtained by using the Spearman-Brown formula described by Guilford and Fruchter, 1973, pp. 410-415).

The audio-visual media presentation on psychopharmacology as described above was placed on reserve at the learning resource center of the college where it was available to the students during the hours the center was open. A list of students was given to the librarian, and only those students assigned to the experimental group were allowed to check out

the psychopharmacology tape and slides.

During the lecture session prior to the psychopharmacology unit the students in the control group were told to report for the next lecture session at the same time and place. The students in the experimental group were told of the slide-tape presentation available to them in the learning resource center, of the hours the center was open, and that they were not to report to class for the next lecture session, Instead, they could view the multi-media presentation at their leisure. Both groups were told when the exam covering psychopharmacology would be given.

Both control groups were given the psychopharmacology lecture as previously described, while the experimental groups viewed the multi-media presentation on their own time.

The following week both lecture groups, consisting of experimental and control groups, took the teacher-made test covering the psychopharmacology material. Both lecture groups were given the same test. Students used IBM cards as answer sheets and the tests were machine graded. Each group numbered 21 students.

A 2 factor analysis of variance was used to measure the effect of the two teaching methods (lecture and multi-media, individualized approach) on the mastery of material of material of high and low achievers in both groups. This analysis of variance was described by Linton and Gallo. (Linton and Gallo,

1975, p. 145.)

The special area involved in the study, pharmacology as applied specifically to psychotropic drugs, prevented generalization to other academic areas. The experiment was designed also specifically to be used in the education of associate degree nursing students and may be used in other schools besides Alvin Community College. However, the study may not be applicable to diploma or baccalaureate nursing programs.

The experimental design did not permit control for the various or previous experiences some of the students have in the hospital, either in their present work situation or in other learning settings.

Use of only one teacher in the presentation of both traditional and experimental methods constituted another limitation of the study. If the study is replicated using another teacher, the study will be strengthened.

No person is exactly like another in interest and attitudes toward the learning activities and the subjects' perserverence, motivation, and aptitudes varied. Personal responsibilities of the learners and spans of time utilized by the students for learning differed.

An analysis of variance involving the factors of teaching method and ACT achievement level was performed on the data

from the teacher-made, objective test. As the analysis of Table 1 and Table 2 in the Appendix reveals, there was no significant difference in the scores of students receiving traditional or multi-media, individualized instruction. The means of the two groups (found in Table 3 in the Appendix) did not differ significantly from one another. Table 1 and Table 2 further reveal that the high and low ACT achievement level groups did not differ significantly from one another. The interaction effects of teaching method and ACT achievement level were also not significant.

This study indicated that students of high and low ability acheived equally well on the test regardless of whether traditional or multi-media, individualized methods of instruction were used. These reports support Thompson's and Stein's findings (Thompson, 1972, pp. 453-456) (Stein, 1972, pp. 436-437) and lead one to speculate whether student nurses have different cognitive styles from other college students or whether the material studied in nursing lends itself less readily to differing methods of presentation. Perhaps more academic courses such as psychology and French are presented better via multi-media methods than are nursing courses.

However, failure to find a significant difference in the factors of teaching methods, ACT achievement level, and time of class may have been due to several errors in the experi-

mental method in 1977 which were corrected the following year. The teaching team had decided in 1977 that the results of the psychopharmacology test, since it was an experiment, would not contribute to the student's final grade in the course. This fact was reflected in the course syllabus in which the total number of tests and the dates thereof were clearly stated. Students who read the syllabus were aware that the grade on the test did not count and consequently many were not motivated to study. In 1978 students were told they could substitute a high score on the psychopharmacology test for a low score on their first unit test in the course grade computation. An analysis of Table 3 reveals a difference of over 10 points in the mean scores of the groups over the 2 year period. Once again the importance of motivation in learning is emphasized.

In an effort to control for the Hawthorne effect the experimenters did not tell the students that they were participating in an experiment in 1977. Consequently, students continued to employ their usual study habits. It was later discovered that friends assigned to experimental and control groups studied together for the test. Many members of the control group magnanamously shared the notes they had taken at the lecture with their friends in the experimental group. In 1978 it was decided to risk the Hawthorne effect in order to control this sharing of lecture notes.

While the experiment was being conducted, Alvin Community College was in the final stage of a building construction program. Parking space was at a minimum and the Learning Resource Center was in the process of moving into the new facilities, which undoubtedly decreased the likelihood of students utilizing the multi-media presentation to the greatest extent. When the experiment was repeated in 1978 these intervening variables were no longer operating, since the building program was completed.

The teaching team, responding to the need for a continuing search for better teaching methods, was appreciative of the opportunity to study differing methods. The awareness of the importance of research in nursing education has been one of the outcomes benefiting the instructors. Future research should take into consideration not only methods of teaching but also cognitive styles of learning.

Table 1 (1978)

Source	df	SS	MS	F
Teaching method	1	411.85	411.85	1.5764
ACT achievement level	2	137.52	68.76	.2632
Time of class	1	80.04	80.04	.3064
Method X ACT achievement	2	42.29	21.145	.0809
Method X time of class	1	105.2	105.2	.4027
ACT X time of class	2	94.1	47.05	.1801
Method X ACT X time of class	2	897.52	448.76	1.7177
Error	72	18810.29	261.254	

Table 2 (1978)

Source	df	SS	MS	F
Teaching method	1	216.6	216.6	1.2333
ACT achievement level	2	212.94	106.47	.6063
Method X ACT achievement	2	506.8	253.4	1.4428
Error	54	9483.6	175.62	

Table 3
Examination Data

	1977	1978
Maximum score	100	100
Mean Scores on Psychopharmacology Text		
Teaching method		
Traditional	67.09	79.4
Individualized	62.67	73.3
Achievement on ACT test battery		
High	64.36	76.7
Low	66.64	76
Time of class		
Morning	63.90	
Afternoon	65.86	

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